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ABSTRACT

Trends in using computer technology for career development and human resources development in companies in the United States and worldwide were reviewed, and the possibilities of adapting the latest advances in digital technology-based training delivery systems in school-based contexts were explored. A model was proposed that entailed having chief information officers and knowledge managers from the corporate world assist in counseling services and participate in development of developmentally appropriate curricula at all educational levels. The following were among the conclusions and recommendations presented: (1) the application of technology to all aspects of life and work is forcing providers of career development programs and services to analyze the needs and wants of their clientele and the way technology can be used in career-related decision making; (2) culturally diverse learners vary greatly in terms of wants and needs; (3) the conceptual frameworks of school-based career development models must be modernized and upgraded, based on advances in computing and information technology; (4) global strategic alliances can yield digital dividends for many nations and people; and (5) preparing educators to use technology for career development in electronic paradigms as well as traditional settings is essential for equality of access to high-quality opportunities both domestically and globally. (Contains 50 references.) (MN)

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CAREER DEVELOPMENT

e-PARADIGMS FOR

DIGITAL DIVIDENDS

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CAREER DEVELOPMENT e-PARADIGMS FOR DIGITAL DIVIDENDS

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Introduction

Areas and regions that are prospering during an era of complex and rapid advances in science and technology are (a) applying best practices in planning strategically, (b) developing a mind-set for re-engineering of establishments and communities, and (c) attempting to synchronize programs and services relative to human resources development to a preferred scenario with an action plan. VISION QUEST emerged when only a few establishments that used strategic planning expected advances in technology to be as complex as they were, had difficulty in extrapolating technologies into the future, could not comprehend the convergence of multiple technologies into the driving and unifying force they have become, and wanted to create "future-pull" strategies to reduce the lag between imagination of an idea and the design through development plus implementation of it. VISION QUEST places emphasis on assessment plus detailed extrapolation of economic and technological variables in an establishment's external environment and their probable impact on life and work as a prelude to an audit of internal variables such as intended program outcomes and the human, fiscal, and technological infrastructure needed to achieve high quality impact.

Numerous issues will be important in the years ahead. Few issues will be as important, however, than co-creating career paths to meet techforce needs for occupations that already exist and for which inadequate community, economic, and education development planning is now occurring. Career development conceptual frameworks in the past in schools extended from awareness about careers in the early years to services intended to provide students with competencies and skills for work. Advances in technology during the past few decades were included in curriculum in a variety of ways, sometimes in sciences tied to standards and sometimes in Technology Education. Several states developed excellent conceptual frameworks for the inclusion of technology into curriculum in "career clusters." Conceptual frameworks are useful if (a) advances in and applications of technology are added into curriculum, (b) developmentally appropriate learning units are co-created to meet the needs of all or many of the "shareholders" and (c) delivery of learning units goes beyond site-based formats to Anytime (24 X 7) Anywhere systems.

Conversion from paper- and site-based formats to electronic and mobile formats has resulted in a critical shortage of classical Information Technology (IT) professionals and technicians, given rise to an array of new occupations and roles for which programs do not exist in colleges and schools, is challenging leadership in the free world, and is creating numerous types of "Digital Divides." Classical IT occupations consist of database managers, network administrators, and other roles associated with "systems-centric," "PC-centric," and early "Network-centric" environments. Consumer-centric environments via broadband, biometric, card, voice, and wireless (mobile) applications have given rise to new waves of occupations. Electronic Commerce (EC) is a little over a decade old and has evolved into B2B, B2C, and M-Commerce. Health Informatics (HI) and Medical Informatics (MI) roles have emerged along with Chief Information Officer (CIO) plus Knowledge Manager (KM), Training Knowledge Manager (TKM), and other "siblings." In addition, Anytime Anywhere Learning (AAL) has emerged from 24 x 7 x 365 training in multiple languages worldwide into "Professional Development for Education." How can PT3 programs use these concepts in curriculum development and Human Resources Development?

Characteristics of Electronically Networked Cultures (ENCs)

Electronically Networked Cultures (ENCs) have evolved over the past several decades beginning with Computer Scientists (CSs) and Electronic Engineers (EEs) collaborating on defense projects. A "new wave" of ENCs began when the New York Institute of Technology offered a four-year degree program via a personal computer and modem in 1984. The School of Computer and Information Sciences (SCIS) at Nova Southeastern University (NSU) made use of Electronic ClassRooms (ECR) in the delivery of doctoral programs in the late 1980s. ECRs were used in a Child and Youth Studies (CYS) program at NSU that began with Leadership I in 1991 and ended course work with Leadership II three years later. CYS is significant because the Kolb Learning Styles Inventory and a modified Myers-Briggs were administered to cohorts. The modified Myers-Briggs was an attempt to gain insights into how Strategic Humanists, Pragmatic Humanists, Strategic Planners, and Pragmatic Managers were most likely to use information. Personal Data Variables, changes in "mind set" attributable to course and practicum experiences, and pre and post scores for the above-mentioned instruments were analyzed for professionals in the U.S. and for a few foreign countries. Comparisons were made among five cohorts in courses in the doctoral program in the multi-tech delivery system with some learning units online and between cohorts in the multi-tech format with cohorts in a site-based format. In a formal doctoral degree learning continuum, the "Orientation" to expected program outcomes, clarity to course objectives and expected outcomes in the first seminar, "induction" to the machine and system, and transition to the next learning experience were critical. Leadership I contained common concepts for which all members of the cohort were to demonstrate proficiency. Leadership II began with a synthesis of significant concepts learned in core and specializations that cohort members were to apply to a problem to be addressed that was unique to each person's context, pre K-12, and child care worker and teacher preparation post-secondary contexts (Groff, W., 1994 and 1995a).

ECRs were used in advising professionals working on dissertations and practicums throughout the U.S. and a few foreign countries, mostly in Asia, beginning in 1995-96. Participants included professionals who ranged from novices to a few who were proficient in multiple systems and technologies. Centrality of problems and issues, topic, is a critical element along with research methodology and procedures and presentation of results. Many of the projects were strategic plans to integrate technology into diverse education contexts (Groff, W., 1996b).

ENCs are evolving in a variety of ways. Sweden has the highest cell phone penetration and, along with Finland, Norway, and Iceland have taken to the Internet more enthusiastically than virtually any other part of the world, including the U.S. "TelecomCities" are evolving like Karlskrona in Sweden. On one of Karlskrona's small islands, the inhabitants have no fixed telephone lines, only wireless application phones (WAP) phones and broadband cables, to test how far application of technology can go to improve Quality Of Life (QOL) for the technology-friendly local population.

Ennis is one of Europe's new "wired towns." Telecom infrastructure has been installed, PCs were supplied to 82% of the town's 5,000 households and thousands of residents have been made computer literate through Ennis Information Age Town (EIAT). Attention is focused on evolving "proactive" relationships between children in primary education, ages 4-12, teachers, and computer and multimedia technology (Groff, W., Strategic Planning, March, 2001).

Developmentally Appropriate Framework for Knowledge, Skills

Community, economic, and education development can occur at the same time. The conceptual framework for The Communication System will be used with Chief Information Officer (CIO) and Knowledge Manager (KM) roles to illustrate competencies and skills for professional education.

THE COMMUNICATION SYSTEM

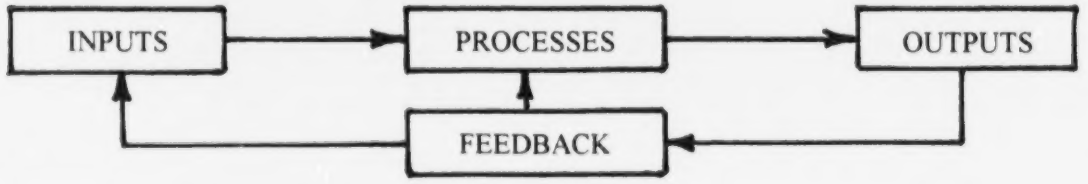

Figure 1. A Basic Model of "The Communication System."

Basics of the digital era include awareness of emerging technologies. A diagram of how the roles of CIOs and KMs could assist in awareness raising about advances in technology in middle school and then lead to career awareness and exploration in higher levels is displayed in Figure 2 below. CIOs engage in accessing information, analyzing information, and redistributing information to KMs who critique the information and redirect it to others for use as value added knowledge.

Chief Information Officer (CIO) and Knowledge Manager (KM) in Education/Training

	Accessing Information	Analyzing Information	Redistributing Information	Critiquing/Using Knowledge
Awareness Early Years				
Exploration Middle Years	Biometrics Card Graphic Arts Voice Wireless Other technologies And, combinations		Electronic Books Reach Libraries http://www.netlibrary.com http://www.questia.com http://www.ebrary.com Article: http://www.jsonline.com/news Milwaukee Journal Sentinel, April 8, 2001, 2B Electronic Publishing http://www.electronic-publishing.com	
Specialization Secondary Years				

Figure 2. A Basic Paradigm for Career Development Enhancement via Knowledge Management

Diversity and readiness are key concepts in considering developmentally appropriate learning. Cultural diversity plays a role in acceptance, behavior, and ways of viewing various phenonena. Diversity related to learner "special needs" and Assistive Technology (AT) availability influence decision making about developmentally appropriate learning experiences. Readiness also has many dimensions including ability to "receive" and fit new data and information into a framework.

Applications of biometric, card, voice, and wireless technologies are occurring at a fast pace. Children often see their footprint used in the identification of a medical record. They soon learn about animal footprints in mud, sand, or snow. Children see the aging of a face on television. Therefore, the stage is set for analysis of biometrics and applications to life and work. Similarly, children may have cards, credit or debit, to obtain items from a "book store" or vending machines in schools. Again, the stage can be set for a developmentally appropriate learning units about smart cards for medical records in world leader France or broad scale applications in Taiwan.

Children use cell phones and youth own them. Some children and youth browse catalogs online and use electronic carts for the purchases they charge to credit cards. What are developmentally appropriate learning units during career awareness and career exploration? How could the units be piloted in a site-based format and be made available in Anytime (24 X 7) Anywhere formats? Children in some families benefit from a bewildering array of contemporary technology but other children and youth are deprived of experiences that are essential to realize digital dividends.

Analysis of biometric or biometric-related information could begin with some of these Web sites:

http://www.ankari.com
http://www.biometricaccess.com
http://www.digitalpersona.com

Analysis of card and smart card information could begin with some of these Web sites:

http://www.cardtechnology.com

Analysis of speech and voice recognition and verification could begin with these Web sites:

Natural Language Speech Assistant	http://www.unisys.com/marketplace/nln/
Natural language on phone to conduct e-business	http://www.altech.com
Text-to-speech	http://www.acuvoice.com
Speech synthesis and text-to-speech	http://www.elan.fr
Medical e-Services	http://www.voicecommander.com
Increase security by speaker verification	http://www.t-netix.com
SpeechTEK Conference & Expo	http://www.speechtek.com
Speech Technology Magazine	http://www.speechtechmag.com
Historically Speaking, 1950s to 2000	http://www.smartpartnermag.com/filters/voice

Analysis of wireless information could begin with some of these Web sites:

http://www.allnetdevices.com/	http://www.wow-com.com/
http://www.wap-resources.net/	http://www.WindCaster.com/
http://www.option.com/	http://www.yospace.com
http://www.waply.com/	http://mfinder.cellmania.com/

Exploration activities extend to (a) browsing Web sites for career cluster categories such as business, engineering, education and training, government, health care and human services, etc.; (b) mining high quality information for an array of topics such as biotechnology, e-books, and categories of establishments in an economy sector such as graphic arts and printing; and (c) acquiring collaborative group competencies and skills in Anytime Anywhere Learning formats.

AMP is the world leader in electrical connectors found in airplanes, cars, and computer. AMP was using EC in the mid 1990s. Tyco International Ltd. operates in all 50 states and 80 countries throughout the world. http://www.amp.com/ and http://www.tyco.com

Thermacore International, Inc.leads the global market in design and production of thermal management solutions for electronic cooling through its divisions Thermacore,Inc.; Thermacore Europe Ltd., Thermacore Korea Ltd.; and Thermacore Taiwan Inc. http://www.thermacore.com http://www.thermacore.com/korea.htm http://www.thermacore.com/taiwan.htm

OUR VISION

"It is our vision to see ... brands
on store shelves in every country."

Kimberly Clark is a world leader in personal care products, consumer tissue products, and away-from-home products. Kimberly Clark manufactures in 20 states in the U.S. plus 38 countries an territories and sells in over 150 countries. Access http://www.kimberly-clark.com and click on "Who We Are," "Worldwide Scope," and "Asia & Australia."

OUR VISION

"We aspire to be the world's premier provider of medical electronic equipment and
Systems used for clinical diagnosis, monitoring, and patient information integration."

GE Medical Systems is defining leadership in the field. Access http://www.ge.com/medical/

Lands' End is expanding full-service e-commerce Web sites. Web sites were launched in the United Kingdon (http://www.landsend.co.uk), Germany (http://www.landsend.de), and Japan (http://www.landsend.co.jp) in November, 1999 and in Ireland (http://www.landsend.ie), France (http://www.fr.landsend.com) and Italy (http://www.landsend.it) in the fall of 2000. Imagine competencies and skills that professionals and technicians must have for needs assessment and market analysis for expanding market share or penetrating new markets. Imagine the mix of competencies and skills that are necessary to design and engineer the technological infrastructure to do B2B, B2C, and M-Commerce globally. Analysis will shape individualized career paths.

Analysis of basic technologies and critique of applications by corporations for an array of products and services worldwide provide value added knowledge about what is needed for high quality Career Development programs and services in Anytime Anywhere and/or campus based formats. Insights from these experiences yield educational specifications and human resources development specifications for policy makers, administrators, teachers, counselors, aides, and all shareholders. Awareness and exploration activities of high quality in the early and middle years can contribute significantly to career goals and objectives during the specialization phase with concentrations. However, specialization should provide exploration in a range of concentrations for confirmation.

Communications is essential in commerce, diplomacy, and literacy in multiple forms and formats. Graphic Arts and Printing (GAP), including pre-press, press, and post-press activities, represent an area of fascination to children and youth and can provide an excellent example of how Career Development can be enhanced via KNOWLEDGE MANAGEMENT through technology in both a discipline or subject centered traditional context and in an Anytime (24 x 7) Anywhere format. How can a coherent set of activities be created to clarify aptitudes and interests and guide learners from awareness through processes that can lead to a range of options within career clusters such as in business, engineering, healthcare, education, public service, and other categories of groups? Businesses need clear, culturally sensitive, effective communications in a increasing number of languages to market goods and services globally in paper-based formats and electronic formats. Engineering enterprises need clear and effective communications for an extensive array of activities ranging to design through application of products of varying standards with warranties. Figure 3 is a basic conceptual framework for envisioning GAP learning units.

	FORMAL EDUCATION					
Grade in	Discipline Subject Centered Traditional Context					
"School"	English	Social Studies	Arts	Math	Nat. Sciences	Technology
10						
	Graphic Arts and Printing (GAP): Pre-Press, Press, and Post-Press					
9						
8						
7						
6						

Figure 3. A Basic Conceptual Framework for Envisioning GAP Learning Units

Developmentally appropriate learning units could be created independently by any teacher. Or, a district could approach Preparing Tomorrow's Teachers to Use Technology with a concise vision as is the case with one of the PT3 funded projects. The district's vision statement is as follows:

> "Our vision is to provide universal access to 21st century technologies that will enhance teaching and learning – anywhere, anytime, for anyone."

"Access to 21st century technologies" implies at least awareness about biometric, card ,voice, and wireless technologies for all shareholders. Awareness for all diverse learners suggests criteria for learning units that are articulated vertically and horizontally integrated in a problem-based format for systemic curriculum development. Assume the above-named technologies are "basics" and board policy requires their introduction in the early years. Education specifications, technological infrastructure, and professional development would be needed for counselor staff and teachers. A comprehensive approach to Career Development would require all providers of services to experience at least some of their training in an Anytime Anywhere Learning format.

"Universal access" offers unique challenges and opportunities. What are developmentally appropriate learning units for children and youth with arm, hand, and mobility impariments? Challenges are more complex for children and youth who are blind or have low or poor vision. Challenges are also complex for children and youth with major hearing and speech impairments. Challenges become extremely complex when above-mentioned impairments are in combinations. And, the challenges become even more complex when in combination with learning disabilities. However, children and youth accept challenges and can be guided to turn them into opportunites.

Adaptive computing technology and Assistive Technology (AT) are descriptors associated with providing access and equality of opportunity for Americans with disabilities. Children and youth could find a great deal of enjoyment in assisting peers with disabilities to access, browse, and mine information during awareness and exploration stages of career development. Children and youth would learn about diagnosing impairments and problem solving for "citizenship" purposes for improving Quality Of Life (QOL). AT resources to browse and mine could include the following:

Alliance for Technology Access (ATA)	http://www.atacess.org
Archimedes Project	http://archimedes.stanford.edu/arch/
Assistive Technology Education Network	http://www.aten.ocps.k12.fl.us
Center for Applied Special Technology	http://www.cast.org/bobby/
Center for Accesible Technology	http://www.cforat.org
Center for Assistive Technology (CAT)	http://wings.buffalo.edu/ot/cat/index.htm
National Center for Accessible Media (NCAM)	http://www.wgbh.org/wgbh/pages/ncam
Sun Microsystems Enabling Technologies Program	http://www.sun.com/tech/access/
Trace Research and Development Center	http://www.trace.wisc.edu/
Web Accessibility Initiative (WAI)	http://www.w3c.org/WAI/
World Wide Web Consortium	http://www.w3c.org/

Advanced exploration stages in Graphic Arts and Printing coupled with insights gained from the above-mentioned Web sites and application Web sites at colleges and schools could enhance the learning by children in a classroom and possibly in classrooms through a district or service area. Level I and II research universities have a base of knowledge that is available. Examples are

Oregon State University	http://osu.orst.edu/dept/tap/
University of California at Los Angeles	http://www.dcp.ucla.edu/
University of Missouri, Columbia	http://www.iatservices.missouri.edu/adaptive/

PT3 projects at research universities can demonstrate Knowledge Management (KM) activities. Above-mentioned "aides" could browse and mine AT applications for impairments in schools.

Beyond the Web sites identified for awareness and exploration earlier in this discussion, resources that could be used during advanced exploration about GAP in the middle years could include:

Graphic Arts Technical Foundation (GATF)	http://www.gatf.org
International Prepress Association (PA)	http://www.ipa.org
National Association for Printing Leadership (NAPL)	http://www.napl.org
Printimage International (PII)	http://www.printimage.org
Rochester Institute of Technology (TIT)	http://www.rit.edu
Windsor Professional Information	http://www.infoblvd.net/jea

Advanced exploration could lead to clarification about career options within broad GAP careers. "Printing and Publishing" is one of several categories of manufacturing establishments for which the Census Bureau collects information in five year increments –years ending in a "2" and "5." Because e-books have evolved and Electronic Newsletters (ENs) have grown in quality and quantity, it is critical to understand concepts such as trend analysis. The November issue of Electronic Publishing contained an extensive list of digital media manufacturers. Included are:

Appleton Papers	http://www.appletonpapers.com
Fox River Paper Company	http://www.foxriverpaper.com
Georgia-Pacific Corporation	http://www.gp.com
Hammermill	http://www.hammermillpaper.com
International Paper	http://www.internationalpaper.com
Neenah Paper	http://www.neenahpaper.com
Wausau Papers	http://www.wausaupapers.com
Weyerhaeuser	http://www.weyerhaeuser.com
Xerox	http://www.xerox.com/supplies

Accessing, browsing and mining high quality information are essential competencies for everyone. Curriculum development issues begin to emerge about developmentally appropriate learning units for career development in middle years relative to emphasis on professional and technical tracks. Beyond accessing, browsing, and mining competencies and skills are cognitive and technical processes for group communication/computing that may include field force wireless automation. How could such dimensions be considered and when and where should they be introduced?

"Middle" years are especially important in career decision making. How can existing human and technological resources be used for career development exploration enhancement for an economy sector, like aspects of Graphic Arts and Printing (GAP)? What roles could CIOs in corporations play in collaboration with KMs in educational settings and Community Learners Centers (CLCs)?

Graphic Arts and Printing (GAP): Pre-Press, Press, and Post-Press

Chief Information Officer (CIO) and Knowledge Manager (KM) in Education/Training

	Accessing Information	Analyzing Information	Redistributing Information	Critiquing/Using Knowledge
Grade in "School"	Discipline Subject Centered Traditional Context			
	English	Social Studies	Arts	Math	Nat. Sciences	Technology
7-8 Advanced Exploration						
4-5 Early Exploration						

Figure 4. Career Development Exploration Enhancement for Graphic Arts and Printing via KM

Quad/Graphics Inc., indicated that it would invest $600 million between July 2000 and 2002 to expand its facilities worldwide to help fulfill a new contract to produce nine million copies of National Geographic. Article authors and photographers travel and work throughout the world. Articles are written, many with photographs, and often sent electronically to printing centers. Pre-press awareness and exploration career path opportunities expand greatly by analysis of the competencies and skills of diverse roles required to produce regional issues of that publication.

Quad/Graphics is the world's largest privately held printer, employing more than 12,000 people at printing plants and sales offices in a 24 x 7 x 365 Anytime Anywhere around the world enterprise. Quad/Graphics is a recognized leader in print technology and innovator in employee management. Customer Relations Management (CRM) career path opportunities expanded greatly with the conversion from face-to-face (f2f) interactions to electronic transactions in B2C and B2B with e-CRM. Quad/Graphics has a vision to become the best customer service organization in the world.

Quad/Graphics won two of the highest honors for outstanding printing performance, April 2001. Newsweek Inc., publisher of Newsweek magazine and a division of The Washington Post Co., named Quad/Graphics' Hartford, WI, plant its "Printer of the Year" for the 16th consecutive year. Time Inc., publisher of several popular consumer magazines and a division of AOL Time Warner, named Quad/Graphics' Sarasota Springs, NY plant its "Co-Printer of the Year" for its production of Sport Illustrated, Time, and People Weekly. Imagine how exciting learning can become when accessing, browsing, and mining information for value added knowledge is a centerpiece of the education enterprise to prepare the next generation for digital dividends. http://www.qg.com

Educators prepared in the use of technology for both content within curriculum and in delivery of it in either campus-based or online formats have difficulty in attaining competency and maintaining proficiency in waves of software and upgrades. As terminals tethered to mainframes gave way to free standing and/or networked personal computers, continuing staff development had to occur. Then came portable computer and hand held devices. Biometric, voice recognition, and wireless technologies in "field force" and site-based workplaces must be integrated into curriculum.

Challenges can be viewed as opportunities for charter collaborative partnerships with strategies. Browsing and mining Web sites would provide outstanding information that can be used in developmentally appropriate learning units in career awareness and exploration activities. How the Internet evolved from the Advanced Research Projects Agency NET (ARPANET) in 1969 until Mosaic was created in 1993 could be a foundation set of units in early exploration. Web browsers became widespread and e-business evolved, units for specialization/concentrations.

Cultural, demographic, economic, geographic, political, sociological, and technological variables area a foundation for "current events" and alternative future scenarios. "Geography Bees" in a f2f format often began with local, regional, and world physical geography ranging from low order cognitive factual information recall to higher order cognitive integration and synthesis. Questions would extend to cultural, economic, and social dimensions with the same cognitive low to high processes. "Fast forward" to the future. What type of AAL "Geography Bee Online" could be co-created that could lead to improved QOL relations between China, Taiwan, and the U.S? What career exploration and specializations questions are needed for "Digital Dividends" in 2020?

Career development services between exploration to specialization in a school-based context can be enhanced greatly through a partial technological or intensive technological delivery system. Figure 5 is a model for enhancing equality of opportunity and quality of career development services. CIOs and KMs would assist counseling services and in curriculum development.

Career Development: Exploration to Specialization

	Chief Information Officer (CIO) and Knowledge Manager (KM) in Education/Training			
	Accessing Information	Analyzing Information	Redistributing Information	Critiquing/Using Knowledge
	Career Counseling Services		Curriculum Development Programs	
Grade in "School"	Assessment, Counseling Guidance, Placement	Discipline Subject Centered Traditional Context English Social Studies Arts Math Nat. Sciences Tech		
11-12	Advanced Specialization			
9-10	Early Specialization			
7-8	Advanced Exploration			
4-5	Early Exploration			

Figure 5. A Paradigm to Enhance Career Development During Exploration and Specialization

Specialization contains both awareness and exploration as well as concentration within it. Specialization should not mean an early selection of a career to only pursue developmentally appropriate learning units in a "planned mode" thereafter. Awareness and exploration could result in narrowing the broad range of selection of roles in business, engineering, law, medicine and health, services, etc. Awareness in business could lead to exploration in economy sectors such as agriculture, manufacturing, and the diverse array of service sector establishments.

Awareness and exploration for specialization with concentration refines career choices to pursue. A child could have been fascinated when Ananova appeared, analyzed integration of technology, and decided to explore "business" opportunities and "engineering" an Ananova for the school. Imagine children and youth reading the release of Ananova in April, 2000:

> She has green hair, a thin smile and heralds a different way to get the Net – via voice. Ananova, the first virtual newscaster, debuted on the Web, attracting a lot of media and user interest. Ananova reads news, generating human sounding speech from text. Eventually Ananova will be able to listen and interact with her audience...."

"What were Ananova's famous first words?" the teacher asked followed by "What are the technologies that make Ananova work?" and "Who are the closest lookalikes?" Browsing and mining could be guided by CIOs and KMs in a region (Groff, W., Strategic Planning, June 2000). Imagine children developing a "business plan" to design and to use their Ananova in schools.

Early Specialization could consist of concentrations of developmentally appropriate learning units within career cluster ranges. Business activities range from functions such as market analysis as used by corporations identified earlier in this document through a chain of manufacturers and distribution of products through retailers and wholesellers, plus customer relations management. All business processes in each category of establishments are faced with conversions from paper-based to electronic formats. Hence, B2B, B2C, and M-commerce activities could be available. Enterprise based career development systems are focused primarily on meeting training needs. AMP had over 500 employee training programs for Central and South America in a distance learning format in the mid 1990s. How could such programs be modified for school-based use?

Advanced Specialization could consist of concentrations in roles within a career cluster range. Engineering activities are in biomedical, civil, computer, electronic, environmental, industrial, materials science, mechanical, and other fields of concentration. Biometric, card, voice, wireless, and other technologies are invented by engineers. Applications of these technologies are designed and developed by engineers. An analysis of articles by learners at this level is most appropriate.

Analysis could include articles such as the following by DeVoney and Hakala (Dec. 11, 2000). "Consider the market for biometric authentication devices – which allow users to sign on to secure networks using a fingerprint, an iris scan and so on. Dramatic price reductions are making the technology affordable, and heightened concerns over security and privacy have customers taking a close look at biometric devices. Moreover, government regulations soon may make biometrics virtually mandatory for health-care, financial and e-commerce applications."

Advanced specialization should include analysis of competencies and skills required by companies for domestic and international commerce in electronic formats - B2B, B2C, M-commerce, eCRM. Conference programs and business executive programs by universities could also be critiqued. Figure 6 is a conceptual framework for early and advanced specializations plus concentrations.

Career Development: Specialization and Business Concentrations
Chief Information Officer (CIO) and Knowledge Manager (KM) in Education/Training

	Accessing Information	Analyzing Information	Redistributing Information	Critiquing/Using Knowledge
Career Counseling Services		Curriculum Development Programs		

Early Specialization	Advanced Specialization	Concentrations
Business	CIOs and KMs in Businesses	KM in a Business
Market Analysis (MA)	MA in Asia Pacific, Trend Analysis	MA in North Korea
Manufacturing Chains		
Distribution – Logistics	Air, Land, and Sea (ALS) to Asia	ALS to Inchon
Retail, Resellor		
Services	Financial, Government, Health Care	Health Informatics (HI)
Wholesale		
Customer Relations Mg		eCRM in Health Care

Figure 6. A Conceptual Framework for Advanced Specialization and Business Concentrations

What collaborative business-to-business, community-to-community, and education-to-education partnerships are needed between South Korea and the U.S. to improve QOL in North Korea? How could business-to-business and community-to-community activities be used in education? Critical thinking competencies (CTC) and problem solving skills (PSS) are essential in new roles. Examples in agriculture, personal care products, and health care illustrate CTC and PSS needs.

Chicago is an agricultural export center for the breadbasket of the mid-west. Inchon is becoming a major center for Asia Pacific. What CTC and PSS are needed in MA to determine the products that could be exported to both or either of the countries in Korea via distribution modes that are most cost efficient, including the use of delivery methods returning to point of origin in the U.S? What agricultural exchange Web sites would be useful in early specialization (Morphy, E., 2001)?

AgEx	http://www.AgEx.com
CyberCrop.com	http://www.cybercrop.com
Dairy.com	http://www.diary.com

What are the implications for Land Grant university extension programs throughout the U.S.? What collaboration can occur with Future Farmers of America programs?

Kimberly Clark has plants in Anyang, Kimcheon, and Taejon in South Korea? What CTC and PSS are used by business, community, and diplomatic leaders to create partnerships for production, distribution, and sales of personal care products in North Korea? What CTC and PSS do students need to provide a competent continuing supply of human capital for improved QOL in N. Korea? How can cyberuniversites in S. Korea and the U.S. collaborate (Cohen, D., 2001)?

GE Medical Systems is partnering with Abbott Laboratories, Baxter International, Johnson & Johnson, and Medtronics, Inc. in forming an Internet-based marketplace that will allow hospitals and other health care facilities to link directly to suppliers.

Abbott Laboratories	http://www.abbott.com
Baxter International	http://www.baxter.com
Johnson & Johnson	http://www.johnsonjohnson.com
Medtronics	http://www.medtronic.com

What CTC and PSS are needed about products and services available by these five companies. Abbott has science education programs about pediatrics and HIV/AIDS. How can the programs be used domestically in neighborhoods to improve QOL and then in Africa and also elsewhere? Baxter is passionate about delivering critical therapies for life-threatening conditions worldwide. How can Baxter's continuing education, customer service, and e-commerce solutions be used? Johnson & Johnson is the world's most comprehensive and broadly-based manufacturer of health care products via 190 operating companies in 51 countries, selling products in 175+ countries. How can browsing and mining Johnson & Johnson Web sites contribute to career development. Johnson & Johnson Medical Taiwan (http://www.jjmt.com.tw) and Johnson & Johnson Taiwan, Ltd. (http://www.jmt.com.tw) provide a full range of products and services for health care. Medtronic was listed as a leading exporter of high technology in World Trade in October 1998. What CTC and PSS can be gained from a critique of Medtronic mission, vision, and business processes that are used to market high technology products and services in various countries? How could partnerships between China, Taiwan, and the U.S. corporations and governments address QOL priorities in Asia such as the rapid spread of AIDS?

CIO and KM roles vary considerably across categories of establishments, especially among the "goods" producing sectors of agriculture and manufacturing in comparison with the "services" sectors of retailing, financing, healthcare, education, government, etc. Although CIOs have evolved in the private sector for over a decade and in public sector roles in states and some large or wealthy municipalities over the past few years, little mention is made about education.

Creative methods must be developed for building competencies and skill at the rate of innovation. CIOs and KMs in diverse establishments in a region could be electronically networked with a CIO in colleges and universities of a consortium. Chicagoland aspires to be a global leader in wireless technology applications. CIOs and KMs involved in applications of wireless technology could distribute electronically nonclassified information to CIO-KMs for redistribution to business, computer science, and engineering programs for use in certificate and degree undergraduate and graduate programs as well as to Technology Education (TE) professional educators who could co-create developmentally appropriate learning units with graduate students and deliver them electronically to school districts for customization and refinement based of policy and standards.

Chicagoland is attempting to become a leading "wired city" as can be seen in the following items. "Chicago has the fourth largest regional technology economy and the second-fastest information technology (IT) growth in the nation." "Recognizing this, the City of Chicago introduced several programs...." – Richard M. Daley, Mayor http://www.chicagotechtoday.com

"The Chicagoland Chamber of Commerce made history by being among the first chambers in the nation to have its website accessible using wireless devices. http://www.chicagolandchamber.org/

"The West Coast is the technology industry's center of software development and venture capital, and the East Coast is home to the financial markets and industry heavyweights such as AT&T and IBM. So where does that leave the Midwest? Chicago industry leaders joined InformationWeek editor John Foley to discuss that question in a roundtable discussion...." InformationWeek. Are there opportunities for Midwest-based businesses to play a leadership role in emerging technologies? Mary Tolan, global managing partner with Andersen Consulting said, "Absolutely. Right now in the United States, there's no region that takes any claim or has any real rigorous reason to take a claim to wireless leadership. There's so much available here in the Midwest that we can assert leadership; in fact, we've begun a Chicago-based community of companies that also is working with the governmental agencies to try to establish Chicago and the Midwest as a hub for U.S. wireless innovation." -- Foley, John. "Watch Out, Silicon Valley." INFORMATIONWEEK, Nov 20, 2000, 65-76. http://www.informationweek.com

Furthermore, Chicagoland has at least three Electronic Newsletters (ENs) delivered regularly:

E*Prairie	http://www.eprairie.com/
i-Street	http://www.i-street.com/
Crain's Chicago Business	http://www.crainschicagobusiness.com/

What career development implications are critical to include in programs for children and youth? What could educational leaders begin to consider doing on Monday in application of technology for career development enhancement collaboratively with businesses and community agencies?

The 202 Corridor, PA, was designated as the best place to do business by The Industry Standard (February 19, 2001). The Delaware Valley Electronic Data Interchange Council (DVEDIC) and The Eastern Technology Council (ETC) have contributed significantly to making the area a high tech magnate. DVEDIC was one of the first regional organizations focused on Electronic Data Interchange (EDI) to facilitate E-Commerce. The 10-year old ETC has provided a forum for the exchange of mission critical information about technology, training, and startup venture capital. ETC made a major commitment to E-Commerce as well to training to help meet techforce needs. Drexel University, The University of Pennsylvania, and many other colleges and universities are active participants in the region's drive to be a global leader in economy sectors. The Wharton School has an Electronic Newsletter (EN) with information on application of technology to EC. Also, an Electronic Commerce Resources Center (ECRC), one of 16 funded by the U.S. federal government to assist defense subcontractors, is located in West Chester, PA.

Applications of biometric, card, voice, and wireless technologies to improve QOL could be sent by CIOs-KMs in private and public sectors to colleges and universities that are preparing the next waves of graduates for business, engineering, health and human service, public service, and a broad range of contexts in which education and training occurs, including the private sector.

Application of the above-mentioned technologies in EC is accelerating developments in B2B, B2C, and M-Commerce (Mobile). A CIO-KM at a college or university with above-mentioned programs could redirect appropriate information to (a) a peer in a school of business for use in a certificate or degree program, (b) a business educator or technology educator for refinement into developmentally appropriate adult, business, and/or technology education programs. Learning communities could be developed between colleges and school districts in a "service" area where parent advisor committees focused on Career Path Development could enrich learning units due to direct involvement in applications, especially convergence of multiple technologies.

The 202 Corridor contains many pharmaceutical research and development, manufacturing, and health care related establishments. What are the implications for Health and Medical Informatics? How is education in Pennsylvania adjusting career development to reap digital dividends?

The Pennsylvania Governor's School for Excellence for the Agricultural Sciences, Pennsylvania State University, provides an opportunity for 10th and 11th graders to explore career paths for that economy sector. The Governor's School for Excellence for Information Technology hosted by Drexel University and PSU provides an opportunity for 11th graders to explore IT and perhaps concentrate in EC. Other Governor's Schools of Excellence for 11th graders focus on Sciences, Teaching, and International Studies. A four-week summer institute for 48 rising high school seniors is conducted by the Wharton School, University of Pennsylvania. Imagine interpreting some of the insights from Wharton's Electronic Business Initiative (WeBI) for seniors who could be provided a continuous flow of resources from a university with partners throughout the world. http://undergrad.wharton.upenn.edu/programs/highschool.cfm http://webi.wharton.upenn.edu

Pennsylvania's Digital School District Initiative seeks nothing less than to revolutionize education. School districts chosen for this first year were: Carlisle Area School District, Hatboro-Horsham School District, and Quaker Valley School District. http://l2l.org/digitalsd/phasetwo.html

Engineers play a critical role from design and development through project management and service. Engineers design and develop the communications systems; biometric, card, voice, wireless, and other technologies; e-book systems and AAL delivery technologies; AMP parts used in airplanes, cars, computers, etc. to meet international standards; KC personal care product and service delivery systems; GE Medical Systems technology; and the B2B, B2C, and MC systems. What career development specialization and concentrations are needed in engineering for diverse learners to achieve digital dividends? How can corporations partner online with education for career development activities, both counseling services and college curriculum modernization? How can engineering colleges and universities collaborate with diverse school programs online?

Phil Condit, chairman and CEO, The Boeing Company, spoke about "Forging Strategic Alliances: Rethinking the Model" to the Australian Information Technology (IT) Strategic Alliances Summit in August, 2000. He spoke to the group in Sydney from the Boeing Board Room in Seattle.

"Today, I want to talk a little about the global trading exchange we are creating in the aerospace and defense industry. First, let me paint a picture of our industry so you can get a real sense of the sheer scale and scope of our exchange effort. We are an industry that makes a remarkable number of highly technical, sophisticated products...from military jet fighters to commercial jet liners to launch vehicles and satellites. We have customers and suppliers in 220 countries, and have an annual revenues estimated in excess of $400 billion (U.S.). We are about ...270,000 general aviation aircraft; 85,000 military aircraft; 37,000 suppliers; 13,000 commercial jetliners; 5,000 space launchers; and 2,500 satellites. Our products take huge amounts of data to design, build, and support. So we have big databases, lots of computing power, lots of purchase orders, and lots of transactions. Our aerospace industry is far-reaching, complex, and fragmented because of size and scope of work."

"So imagine doing business in an industry where your products have millions of parts; where your suppliers use different procurement systems and operate worldwide; where your company, as ours does, has about 12 million procurement transactions annually. You would come to the same conclusion that many of us did. There is enormous opportunity to improve productivity."

"E-commerce offers us that opportunity, and our neutral Internet trading exchange is one way to do that. Last March, Boeing, BAE Systems, Lockheed Martin, and Raytheon joined forces to create an open, neutral digital marketplace that serves and benefits all buyers and sellers...."

Boeing's commitment statement "Forever New Frontiers" is based by a vision statement.

VISION 2016

People working together as a global enterprise for aerospace leadership.

Core competencies are detailed customer knowledge and focus, large-scale systems integration, and lean enterprise. Values are leadership, integrity, quality, customer satisfaction, people working together, a diverse and involved team, good corporate citizenship, and shareholder value.

http://www.boeing.com/companyoffices.aboutus/mission/index.html

Engineering enterprises pursuing "Forever New Frontiers" need a continuing flow of competent personnel – a challenge for a world class Training Knowledge Management (TKM) capability.

A career development conceptual framework for advanced specialization and concentrations in engineering follows a pattern similar to that of business with multiple possible concentrations.

Career Development: Specialization and Concentrations in Engineering

Chief Information Officer (CIO) and Knowledge Manager (KM) in Education/Training			
Accessing Information	Analyzing Information	Redistributing Information	Critiquing/Using Knowledge

Career Counseling Services	Curriculum Development Programs	
Early Specialization	Advanced Specialization	Concentrations
Engineering	CIO and KM – apps of technologies for B2B, B2C, M-commerce	
Biomedical		
Civil		
Computer		
Electronic		
Environmental		
Industrial		
Materials Science		
Mechanical		
Other categories		

Figure 7. Conceptual Framework for Advanced Specialization and Concentrations in Engineering

Developmentally appropriate learning units in biometric, card, voice, and wireless technologies in awareness career development programs and services articulated to B2B and B2C in exploration would a foundation to domestic database and network analysis by economy sector in agriculture, any combination in manufacturing categories, or service sector categories such as health care. Concentrations could focus in any of the above-listed categories of engineering and emerging CIO and KM roles. A concentration could include student KM aides to counselors and teachers.

KM is emerging with conferences, organizations, and publications some only in electronic format. A partial list of publications and Web sites about KM and/or related to the field includes:

KMWorld	http://www.kmworld.com
Knowledge Management	http://www.kmmag.com
Group Computing	http://www.groupcomputing.com
Field Force Automation	http://www.ffamag.com
Mbusiness	http://www.mbizcentral.com
Exchange & Outlook	http://exchange.devx.com
EC World	http://www.ecomworld.com
Converge	http://www.convergemag.com
Information Week	http://www.informationweek.com
Intelligent Enterprise	http://www.intelligententerprise.com
Internet World	http://www.internetworld.com

Many of the Web sites offer free paper subscriptions and free Electronic Newsletters (EN).

Bulletin board pages were created to assist graduate students to provide content that could be included in Career Pathways for Digital Dividend occupations and to supplement information provided in a continuous flow of contemporary newsletters that are archived (Groff, W., 2001). An "Asia Society" bulletin board page was created to assist clientele from that region to envision continents, countries, and regions being connected by fiber optic cable and career opportunities. "Asia Society" begins with Global Crossing and is followed by Asian Web sites, many with free Electronic Newsletters (ENs). Elementary, middle, and high schools plus university Web sites are listed for Korea. The bulletin board page mentions an outstanding resource developed by Kris Bina Midthun, associate academic librarian at the Golda Meir Library, University of Wisconsin - Milwaukee, that can be used for content in career pathways in business and business education programs (http://www.uwm.edu/~kabina/index.html)

Global Crossing is engaged in connecting continents with broadband and linking country services with technology. (http://www.globalcrossing.com) Beneficiaries are the companies and countries with contracts / subcontracts in globalization related to technological infrastructure development. Global Crossing connected Argentina to the Global Fiber Optic Network (November 15, 2000) and Brazil (November 20, 2000) where bandwidth-intensive applications such as telemedicine, computer-based distance learning, and streaming audio and video will be available new services. Global Crossing has entered an agreement under which Exodus will acquire GlobalCenter, Inc., a wholly owned subsidiary of GC. The combined company would have 32 Internet Data Centers totaling almost 4,000 customers and with strategic partners that include Cisco, Compaq, Dell, Inkomi, Microsoft, Oracle, Softbank and Sun Microsystems. Exodus and Asia Global Crossing have agreed to form a joint venture to provide complex Web hosting and managed services in AP. Global Crossing and Exodus are creating an unprecedented alliance to form the world's most advanced broadband Internet protocol in markets around the world. http://www.globalcenter.net/

"Globalization and the Family of IT Careers" is a bulletin board page primarily for individuals interested in business and commerce related roles. It has links to the 26 Centers of International Business Education and Research (CIBERs) with extensive data bases for countries throughout the world, American Chambers of Commerce throughout the world, more than 300 World Trade Centers in about 100 countries, and high tech exporters in the U.S. Many high tech exporters list available positions, some with detailed competency and skill requirements, that can be used as content in career pathways to meet professionals or technical roles.

"Taiwan" begins with Ministry Of Education (MOE) offices operated in 7 major cities in the U.S. The bulletin board page then includes the Ministry Of Economic Affairs (MOEA) with strategies for "Planning Intelligent Industrial Parks and Building Taiwan Into a Technology Island" plus MOE education reform mandates and the Bureau of International Cultural & Education Relations. Taiwan provides an extraordinary opportunity for collaborative partnerships for Career Pathway development be the focus on community (cultural), economic, or educational development. The "Taiwan Miracle" is a story of a democratic state in communist country yielding a per capita income of $100 in 1951; $ 450 in 1965; $ 8,000 in 1990; and approximately $13,000 in 1999. How could education in the U.S. collaborate with the 7 MOE offices to promote cultural and economic development? How could collaboration with cyberuniversities improve QOL? What joint ventures could be pursued to assist MOEA with economic development goals?

Kathryn A. Green completed a dissertation about diagnosing needs and wants of foreign people and the development of bulletin board pages in response to specified wishes. Asians represent 76% of the foreign students from 46 different countries who are enrolled in this institution in California. The largest number in order are from Japan, Vietnam, Taiwan, and Korea. Majors with the largest number of Asians are (a) marketing, international business plus travel, tourism, and hotel management; (b) liberal arts; and (c) computer science, Web design, and computer programming. Services sought by Asians in interest rank order were (a) career information, (b) tutoring, (c) career assessment and skills for future roles, and (d) job description information. Career/Life Planning steps are available and bulletin board pages were created for clientele from the United Arab Emirates, China, Indonesia, Japan, Korea, Kenya, Taiwan, and Vietnam.

http://www.irvine.quik.com/kgreen/isccc/iscccindex.html

Bulletin board pages for each country contain information about culture, history, government, religion, population, language, currency, business, etiquette, and many links to other resources. Dr. Green's Conceptual Framework, Prospectus, Proposal, and Applied Dissertation are available along with archived newsletters at http://www.blackboard.com/courses/webcom/ (Groff, 2001).

Bulletin board pages will be expanded and links will be added for the above-mentioned countries. Asians benefit initially from this resource, especially people from Japan, Korea, and Taiwan, ROC. Advisees in those countries and fellow Penn State graduates received my newsletters since 1995 and other information in electronic and paper-based formats. The "Asian Society" and "Taiwan" bulletin board pages were more detailed examples of resources that could be created along with "Globalization and the Family of IT Careers" that concentrates on emerging techforce careers. Taipei Economic and Cultural Offices (TECO) in Los Angeles and San Francisco could assist in the development of this resource along with agencies that serve Asians. Furthermore, the idea could be replicated elsewhere in the U.S. with assistance from other TECO offices.

Other projects relate to preparing educators to use technology for career development. Sandra Vance is completing a strategic plan for induction and continuing secondary teacher development for the Dallas Public Schools. Pedro Perez is developing a dissertation proposal to create an online counseling intervention program at Borough of Manhattan Community College in NYC. Jon Nakasone (2000) completed a dissertation to promote equal access to electronic information by disabled students. Susan Moore (2001) developed a strategic plan to provide services to ADA students. David Rutledge (2001) completed a practicum that will lead to an evaluation of career development programs by a high school in Chester County, PA, a major part of the 202 Corridor.

Preparation of educators, including administrators and board members, for career development purposes related to emerging critical occupations or roles is essential to achieve digital dividends. Administrators must be aware of emerging occupations and recommend policy to board members. Programs to prepare secondary teachers have tended to focus on attaining a discipline subject centered competency in one major field and one or two "minor" fields. Competence consists of attaining breadth and depth of skills to conduct a safe practice of pedagogy in multiple contexts. Programs to prepare early childhood teachers tend to focus more on developmentally appropriate learning activities among areas of studies like communications – reading, spelling, and writing. Programs to prepare "middle" level teachers are between the two above-mentioned approaches.

Although applications of technology have increased over the years, focus at the undergraduate level has supported the safe practice of pedagogy for entry level positions in subject matter. Care givers and early childhood educators could be prepared to convert information from Web sites about biometric, card, voice, wireless, and other technologies into many developmentally appropriate learning units in a vertically articulated and horizontally integrated delivery format. Any number of examples could be cited that make effective use of technology based on research. Lightspan is based on research about parental involvement in student learning and technology. The Global Schoolhouse is a great resource with links to projects, professional development, etc.

http://www.lightspan.com http://www.gsn.org

Pennsylvania makes extensive use of Lightspan in its CyberStart program. Ideas about career awareness and exploration about technology could be integrated into the Lightspan activities.

Career development program and services and the use of technology to promote awareness, exploration, and specializations tend not to be included in programs at the undergraduate level. Curriculum standards have competencies and skills often supported with links to resources that are useful in helping to select activities for career development programs and services. Analysis and critique could include browsing and mining Web sites with curriculum standards:

Information Literacy Standards	http://www.ala.org
IT works, Ohio	http://www.itworks-ohio.org/
Skill Standards for IT	http://www.nwcet.org
Telecommunications	http://www.cwa-union.org/
AK:	http://www.eed.state.ak.us/contentstandards/Technology.html
MA:	http://www.doe.mass.edu/framworks/archives/
MI:	http://www.cdp.mde.state.mi.us/MCF/ContentStandards/Technology/
NC:	http://www.dpi.state.nc.us/Curriculum/
PA:	http://www.pde.psu.edu/issini.html
UT:	http://www.usoe.k12.ut.us/
WI:	http://www.state.wi.us/dpi/standards/

An increasing number of career opportunities require international competencies and skills. Education has been expanding awareness and exploration opportunities through Web sites:

Canada's SchoolNet	http://www.schoolnet.ca/
Classroom Connect	http://www.classroom.com/home.asp
Global Schoolnet's Internet Project Registry	http://www.gsn.org/project/index.html
GLOBE Program	http://www.globe.gov/fsl/welcome.html
I*EARN	http://www.iearn.org/
IISDnet	http://192.197.196.001/
U.S. Peace Corps: World Wise Schools	http://www.peacecorps.gov.wws/index.html
Peace Child International	http://www.peacechild.org
United Nations CyberSchoolBus	http://www.un.org/Pubs/CyberSchoolBus/index.html
UNICEF, Canada	http://www.unicef.ca/eng/main.html
UNICEF, Voices of Youth	http://www.org/voy/
World Bank	http://www.worldbank.org/html/schools/
World Eagle	http://www.worldeagle.com/
World Resources Institute	http://www.wri.org

Preparing career development providers of programs and services to use technology is much more than mining Web sites. Competencies become more complex in specialization with concentrations. Dr. James E. Barger (1998) co-created a series of EC units that fit into the Marketing Education program in several high schools in the Virginia Beach City Schools in 1997-98. EC practitioners, teachers, and other educators collaborated in the design and delivery of EC units in high schools. He received Electronic Newsletters (ENs) and distributed good information to peers participating in Electronic ClassRooms (ECRs). Dr. Young Gi Kim recorded content in ECRs and ENs, ran it through a language conversion software package and electronically distributed content at Inchon National University of Education and the Korean Association of Information Education (KAIE).

Inchon National University of Education (INUE) is the largest of 11 universities for elementary teacher preparation (http://www.inchon-e.ac.kr). Dr. Kim's last practicum was a handbook for elementary teachers to integrate technology into curriculum that was shared with KAIE whose members focus on applications of technology at all levels in education. Thus, K-8 teachers had the resource as did all universities that prepare teachers. A presentation to KAIE in 1997 focused on computer based distance education plus E-commerce and the implications for curriculum development. Dr. Kim's dissertation was a strategic plan for the integration of technology into education that included content as well as design of academic and administrative infrastructure that included five adjacent computer labs that could accommodate 170 individuals accessing the Internet simultaneously plus faculty and staff hardware and appropriate training support in 1998. Faculty and graduate students in computer science in education at INUE were provided with materials in a presentation and discussion session on applications of biometrics, card, voice, and wireless technologies in workplaces and the implications for curriculum development in 1999. What preparation of career development providers would be required in awareness or exploration for collaboration between South Korea and the U.S. to improve Quality Of Life in North Korea? How could cyberuniversities in both countries analyze needs in education in North Korea and design curriculum appropriate to the available human and technological infrastructure?

Business education, home economics, technical education plus economics, history, political science, sociology and other teachers contribute significantly to learners in career specialization. E-books, electronic publishing, Electronic Newsletters (ENs), and print-based materials in electronic formats provide contemporary information that must be turned into learning units. Dr. Yng-chein Sheu (1995) developed a strategic plan to create a printing technology department at National Taiwan Normal University (http://www.ntnu.edu.tw) that is now producing teachers and technicians for industry through the graduate level. How could collaboration in an economy sector that is essential to commerce, diplomacy, and literacy occur between Taiwan and the U.S? English instruction in elementary grades has been increased and the Ministry Of Education (MOE) has collaborative agreements with several countries for cultural awareness immersion programs? How can e-information be converted to KNOWLEDGE for career development providers in both Taiwan and the U.S. that could yield digital dividends through improved QOL in Asia?

Dr. Niann Chung Tsai (1993) participated in ECRs and co-created a strategic plan to convert an undergraduate program in a campus-based format to a computer based distance education format. The plan was approved by the MOE and by 1998 Niann was teaching about 1,000 students online with a PictureTel system. A conference in 1999 provided EC curriculum ideas (Groff, W., 1999).

Awareness of demographic, economic, political, social, and technological variables for culturally diverse people must be raised to competencies in understanding in the emerging global economy. A core liberal arts program in anthropology, economics, history, geography, languages, political science, sociology, etc., is critical for preparation for life and work in 21st Century globalization. Excellent historical perspectives are presented in articles by Bentley, J., 1996, and Wigen, 1999. An exceilent resource includes materials by the American Institute in Taiwan (Brekke, W., 1999). Although a historical perspective is absolutely essential for understanding context, it is especially essential to understand how Asia Pacific ECONOMIES become so dynamic and how they are most likely to develop in the future? How can career development educators in school-based programs use technology to acquire a better understanding of global economies and then convert that knowledge into developmentally appropriate learning activities for children and youth? What are basic competencies in KNOWLEDGE of emerging ECONOMIES around the world? What could be questions in the 2020 WORLD ECONOMIES online Geography Bee this year?

The East Asia percent of goods and services produced in the world grew from 3% in the 1960s to 11% in the 1970s to 25% in the 1990s; East Asia is consuming an increased share of goods and services produced by others (Copper, 1998). East Asia will soon pass the rest of the world in production and will probably be bigger economically than the North American free trade area and the European Union combined. The most dynamic region of the world is the Pacific Rim. The Republic of China (ROC) is currently the fastest growing economy and has 22% of the world's population with a large middle class of people who want to buy consumer products.

The European Union (EU) began with 350 million people in 12 nations with the highest per capita income in the world in 1993; EU became a single market for goods and services. Austria, Sweden and Finland raised the membership to 15 in 1995. The EU will probably expand by 12 members by 2003. Candidates include Cyprus, Malta, Hungary, Estonia, Poland, the Czech Republic, Slovenia, Bulgaria, Romania, Slovakia, Lithuania, and Latvia. Turkey is a possible13th candidate. EU launched the Euro in 1999. National currencies will remain in circulation until 2002.

Canada, Mexico, and the United States formed the North American Free Trade Agreement NAFTA), a total population of 320 million people in Canada's 10 provinces, Mexico's 32 states, and the 50 U.S. states. A free trade agreement between Argentina, Brazil, Paraguay and Uruguay began in 1995. Chile joined Mercado Comun del (MERCOSUR) in 1996; Bolivia joined in 1997. MERCOSUR's goal is to incorporate all S. American countries by 2005 before joining NAFTA.

The International Telecommunication Union (ITU) mplemented a new initiative in E-Commerce for Developing Countries (EC-DC) with assistance by WISeKey with "The Secure E-commerce Partnership Seminar" last November. Nearly 500 delegates, including 17 Ambassadors and 4 Ministers, represented some 120 countries and 11 international organizations. http://www.itu.int/

About 1 billion of the world's 6 billion people have access to the Internet. Therefore, 5/6th of the world's people can be viewed as markets. Research about globally competitive communities is being used for "Building Smart and Sustainable Communities and Regions." What career paths are needed to improve Quality Of Life (QOL) for people around the world through technology that could yield Digital Dividends for more "have not" peoples as well as the "haves?"

Knowledge Management (KM) is at the core of all the ideas discussed, individuals cognitively processing data and information using contemporary technology. A child can peer at a computer screen and eye iris or facial body parts recognition software will permit access to the system and then verification software will permit access to files open to individual users. Voice recognition and verification software could also be applied for similar purposes. Card technology, credit or debit, could demonstrate pay for system use. Continuous voice recognition software will allow culturally diverse multiple users to interact instantaneously and simultaneously in several places. And, the users are no longer tethered to a location. Field force automation is widespread.

Dysart (2001) stated that "Knowledge emerges through the interaction in clusters" in a report about the 22nd annual McMaster World Congress coordinated by the University's Management of Innovation and New Technology Research Center. McDonald (2001) discussed the business imperative and KM challenges of globalization in the February issue of KMWorld and addressed the whys and hows of globalization, the legal hurdles and Web site design for international B2B. Imperatives become clearer about the need for inclusion of KM processes in CD e-paradigms.

Graduate level certificate and degree programs hold potential for including career development programs and use of technology. Although practice teaching within an undergraduate program provides a foundation, a few years of experience provides maturity for career decision making. Induction and professional development programs could include units on career development and the use of technology. Then, graduate level learning experiences can expand on a foundation.

Adult counselors and educators have a unique role. Applications of technologies are one cause of economic fundamental restructuring, dislocating large numbers of workers ranging from low skills to highly proficient technologically, but perhaps G1 or G2 during a conversion to Generation 3. Dr. Oscar Vazquez-Melendez (1996) converted General Education Development (GED) material into Spanish to serve Hispanics in Ga, NC, SC, and TN (http://www.escuelaelectronica.com). Adult counselors and educators provide continuing education, community outreach programs, computer literacy and upgrading programs, retraining of dislocated workers, and a broad range of custom designed services such as small business development for many disadvantaged groups.

Culturally specific projects are important for groups below the digital divide. Dr. Carolyn Ryals completed a practicum on a synthesis of culturally specific characteristics of African-American middle school boys. The research was converted to instructional materials in multi-media format for workshops that were presented and evaluated; she has received widespread recognition. Black Enterprise is a wonderful resource with articles like "Information Age Griots" and "What's in a Chip." America's Promise is a wonderful resource and has launched a computer initiative.

http://www.blackenterprise.com http://www.americaspromise.org

Claudia Walker is completing a dissertation on a secondary to postsecondary transition plan for American Indian students at a community college. The project has tremendous implications for preparing career development providers to use technology for the 500+ nations in the U.S.

Bureau of Indian Affairs	http://www.doi.gov/bureau-indian-affairs.html
INDIANnet Census Info and Computer Center	http://indiannet.indian.com
Native Am Tribes: Info Virtually Everywhere	http://www.afn.org/~native

Career development programs need to be developed for individuals preparing to be providers of Anytime Anywhere Training services in education settings. CIO-KM roles involve analyzing data, critical thinking competencies, and critiquing information to add value, problem solving skills. Dr. Stephan Reynolds acquired the competencies and skills of a CIO while working in two private colleges. He developed a strategic plan for the integration of computer services and library services after an extensive analysis of colleges. As vice chancellor for information technology at Indiana University East he developed A Strategic Plan for Integrated Resources and Services. Colleges and universities offering certificate and degree program in multiple delivery formats must provide equal opportunity of high quality for all clientele. CIOs and KMs need competencies and skills in areas ranging from design, delivery, and assessment as well as infrastructure planning.

The University of Maryland University College began to deliver new Executive Certificates and Graduate Certificates Online in the fall of 2000 (http://www.umuc.edu/gsmy):

1. Executive Certificate for Chief Information Officer.
2. Executive Certificate (EC) in International Business.
3. Executive Certificate in the Strategic Management of Technology and Innovation.
4. Graduate Certificate Online in Distance Education and Technology and
5. Graduate Certificate Online in Library Services in Distance Education.

Collaborative computer based distance education projects are evolving rapidly such as the Southern Regional Education Board's Electronic Campus and Western Governors' University. Electronic Campus became a directory of online courses offered by institutions in the 16 S.R.E.B. states. Electronic Campus list over 3,200 courses and 102 degree programs in 262 institutions. About 20,000 students took online courses in 1989-99 (http://www.electroniccampus.org/). Coordination of distance learning is occurring among nations and sometimes with a special focus. Academia Sinica President Yuan-tseh Lee spoke on "Environmental Changes and the Future of Humanity" in February, 2000. Dr. Lee had been in America 40 years earlier and was shocked at resources wasted and found the same thing in Taiwan. Economic development and environment preservation is a focus of coordination of distance learning by 15 universities in Taiwan. Videoconferencing is significant for AAL. The Videoconferencing for Learning Web site has applications and resources for teachers, librarians, and other educators:

http://www.packbell.com/wired/vidconf/
http://www.packbell.com/wired/vidconf/directory.html
http://www.packbell.com/wired/vidconf/edlvidconf.html

Career development programs need to be developed for individuals preparing to be providers of Anytime Anywhere Training services in corporations. Training Knowledge Management (TKM) titles are used for roles extending from training needs diagnosis, program design and delivery, followed by assessment and evaluation. Some graduate and undergraduate programs are beginning to require that at least one course be completed in an online format. Analysis and critique could include browsing and mining Web sites about online learning such as

Inside Technology Training	http://www.iitrain.com
Online Learning	http://www.onlinelearningmag.com
Syllabus	http://www.syllabus.com
Corporate University Xchange	http://www.corpu.com

People working collaboratively domestically and globally for improving QOL

Certificate and degree programs for career development with intensive use of technology could be greatly enhanced via strategic alliances very much like Boeing's EC Internet trading exchange. Alliances with South Korea were suggested that focus on elementary education and reunification. INUE could be an alliance broker and partner for continuing the co-creation of developmentally appropriate learning units in biometric, card, voice, wireless, and other technologies in S. Korea. INUE could distribute electronically the units to the other 10 elementary K-9 teacher preparation universities as well as private colleges, both of which could work with teachers in area schools. Alliance activities could include development of a CIO-KM certificate or degree, possibly with the Association for the Advancement of Computing in Education (http://www.aace.org) etc. Many other technologies could be used as examples such as an analysis of voice technology by Jack Espinal (http://fairfax2.laser.net/~jespinal/vr1.htm). First generation motorized bicycles evolved into electronic vehicles. GM became the first automaker to design and market EV1 in 1996. Mark Quarto (2001) completed a confidential manual for a Saturn EV training program. Confidential research and development as well as initial applications are useful in thinking about what is On The Horizon and should be included in Vision Quest (VQ) applications in education. Robotics is another area for collaboration. As Thomas Hayden (2001) stated, "We're close to making humanlike machines. It's time to reckon with the promises and perils."

Dr. Chong-Sun Hong developed a plan for innovative approaches in English education at Hankuk Aviation University (http://www.hanghong.ac.kr) at the same time that Dr. Shirley Waterhouse developed a strategic plan to help faculty to integrate technology into curriculum at Embry-Riddle Aeronautical University (http://www.erau.edu) and Dr. Richard Coffey co-created a "Professional Development Transition Program" for human resources employees at the Boeing Everett site. How could alliances between Boeing and these two universities, and possibly others, build on that corporation's aerospace global leadership vision to develop graduates in business and engineering career progression e-paradigms that include developmentally appropriate units that INUE could refine and electronically distribute to KAIE members in schools and universities in South Korea.

Ideas for alliances with Taiwan can be seen from some information provided by the Ministry Of Economic Affairs (MOEA) and the Ministry Of Education (MOE). The MOEA site provides information about the economic status and five strategies for building Taiwan into a technology island. An Asia-Pacific Regional Operations Center (APROC) has a focus on Taiwan in the 21st-century with a sound and vigorous economy, stable society, and highly educated workforce. APROC concentrates on six centers (a) Manufacturing Center, (b) Sea Transportation Center, (c) Air Transportation Center, (d) Financial Center, (e) Telecommunications Center, and (f) Media Center. "Trade is Taiwan's lifeblood. Taiwan firms have vast and wide-ranging investments in mainland China. A key area of the APROC plan is to establish between 20 and 30 intelligent industrial parks around the island – 17 of which are under planning or development. With so many compelling reasons to draw them to Taiwan, 46 multinational companies have come and concluded strategic alliances, while 26 have opted to place operations centers on the island." Alliances for community, economic, and education development could be formed for one or more of these initiatives. Taiwan and the U.S. have an extensive history of collaboration that extends from the liberation of the island in the mid 1940s through rebuilding and the current era.

MOE lists 12 education reform mandates; 6 of the 12 mandates are:

1. Revamping National Educational Projects, K-12.
2. Pre-school and Kindergarden Education Projects.
3. Teacher Education and In-service Education.
4. Diversified Vocational (Technical) Education.
5. Lifelong Learning Project.
6. Strengthening Programs for the Handicapped.

Career development (CD) e-paradigms could evolve from APROC commitment to contemporary technology and education reform mandates. The Graphic Arts and Printing Technology (GAPT) program at NTNU can provide a flow of KNOWLEDGE about education reforms worldwide via TECO centers in Chinese and English in electronic format for use by CIOs and KMs in Taiwan. The APROC Telecommunications Center and Media Center can use state-of-the-art technology to receive, process, and send customized knowledge to consumers where technology is available.

What are the specifications for CD e-paradigms and are students prepared to use the new formats. Awareness, Exploration, and Specialization with Concentrations were descriptors used for CD paradigms. Grades were used in three of the figures because the prevailing format and mindset in formal education in traditional schools in the U.S. is a bureaucratic layered and tiered system. Models presented earlier in this discussion began with a basic paradigm in traditional format and emphasized the inclusion of critical technologies and e-books and numerous resource Web sites followed by examples that emphasize application, convergence and integration, and globalization. Then, models were presented for business and engineering specialization with concentrations.

Gen-M and teen gurus are ready for technologies. M-business indicates that Asian and European teens are ahead of American counterparts in cell phone use (Bruzzese, 2001). Bunn (2000) indicates teen gurus are brilliant, ambitious, and almost intuitively gifted at new technology. A culture change is on the fast track in Finland driven by Gen-M and teen gurus using Nokia's wireless technology that will fundamentally restructure the economy and society of that nation of five million people and about the size of Montana. What CD e-paradigm programs and services will Helsinki University design and deliver to Gen-M? (Randon, http://www.mbizcentral.com).

Taiwan consistently ranks 1st or 2nd in math and categories of science in international comparisons and made the transition from vocational to contemporary technical education during the 1990s. Many Taiwanese living throughout the U.S. are employed in business, engineering, and education. Their children attend some of the best colleges and schools and excel in "learning communities." So, a browsing and mining workforce throughout the U.S. exists with extended family in Taiwan. Colleges and schools in Taiwan and the U.S. need competent workforces in air, land, and sea logistics to distribute goods more effectively and efficiently than competitors – agricultural and manufactured products. Analysis of Chicago and Kaoshiung can occur online simultaneously. It is not efficient to have a ship go from Kaoshiung to Chicago and return empty or partially full. Analysis would involve several ports in Taiwan and the U.S. as well as ports in other countries. At what level of education are logistics introduced? What are developmentally appropriate units? What units in logistics belong in general education and what is the curriculum in specialization? How could we collaborate on the preparation of CIOs and KMs in agricultural logistics, etc?

CD e-paradigms can be created for business and engineering specialization with concentrations. A framework for CD models in business and engineering specialization with concentrations was presented earlier in the document. CD models could be created collaboratively or independently for traditional formats with planning to convert them to CD e-format based on analysis of what is occurring in business and engineering certificate/degree programs and consortia around the world. Curriculum content and the nature of the learning experiences need some preliminary discussion. The China Council for the Promotion of International Trade (CCPIT) and the China Chamber of International Commerce (CCOIC) play an important role for enterprises in the Republic of China. What are developmentally appropriate curriculum units in schools and universities? CCPIT/ CCOIC offices in the U.S. are located in Arlington, VA; in St. Paul, MN; and in Dallas, TX.

http://www.ccpit.org

The nature of globalization and a digital divide based on numerous dimensions suggests that students be requested, even required, to have a minimum of one domestic and one cross cultural international experience to apply knowledge intended to assist people below the digital divide. There are 22.5 million cases of AIDS in sub-Saharan Africa. UNAIDS estimates that 5 to 7 million people are now living with AIDS in Asia and the Pacific and 3 to 5 million in India. With 60% of the world's population, Asia could become the region with most HIV infections. Could AIDS be a collaborative project for students in the e-CD specialization stage?

Consortium to consortium alliances (CCA) and university to university partnerships (UUP) are likely to increase for digital dividends domestically and globally. CCAs include Electronic College by SREB and WGU. But, there are many CCAs. Analyses in 1999 yielded many different CCAs including one involving Chicago, Carnegie Mellon, Columbia, Stanford, and the London School of Economics. One of the analyses indicated that business degree programs online contributed to decline of enrollment of business degree programs presented only in traditional format in the EU. The British government has commissioned a business plan for a major international e-university to give corporations and institutions capability to compete globally. A primary focus is e-commerce. Computing for the disabled research became a commitment pledge for 25 research universities in the U.S. in fall, 2000. Could that become a multi-nation e-CD focus in the specialization stage?

United Nations Secretary-General Kofi A. Annan challenged world business leaders to embrace and enact "The Global Compact" at the World Economic Forum on 31 January 1999. "The Global Compact" contains principles for human rights, labour, and environment. He asked leaders to support the principles in corporate practice and public policies. He stated,

> "...let's choose to unite the powers of markets with the authority of universal ideals. Let us choose to reconcile the creative forces of private entrepreneurship with the needs of the disadvantages and the requirements of future generations...."

Recognizing that the "Quality of life in the 21st century will to a large extent be dependent on the preparation of a diverse corp of leaders...," the International Telecommunication Union will host a Youth Forum at ITU Telecom Africa in Johannesburg in November 2001. ITU initiated a Fellowship Programme to fund one individual of college age from each member states in Africa. How can this example be replicated with other organizations? http://www.itu.int/

A hallmark of church affiliated private education in the U.S. is a combined focus on character development – ethical, moral, and spiritual development – along with content area development. Five Assemblies of God employees produced significant dissertations. Dr. Alan Algee completed a dissertation on teaching inter-cultural competence at Faith School of Theology. Analysis of the research indicated two major strategies (a) adding one or more course to curriculum or (b) total immersion in academic and student life programing. Faith School of Theology chose the second and implemented best practices through the freshman year. Dr. Dan Anglin developed a strategic planning guide for use throughout Asia Pacific. Although the Guide was online, AG leadership printed and distributed two copies in print to all of its 1,500 colleges and universities worldwide. Dr. Wardine Wood completed an assessment of needs of 1,700 missionaries in 140 countries and developed a model for education delivery. The highest priority was proficiency in technology. Dr. David Martz created a plan for leadership development for the Institute Biblique in New Caledonia. David is providing leadership for several projects as associate dean of the School of Graduate Studies of Global University (http://www.globaluniversity.edu). Ben Kaufman is completing a guide for leadership development for AG personnel in Asia Pacific. These five individuals have made a significant contribution by character development integration with content relevant to strategic topics – culture, planning, technology and leadership for His will.

Archbishop Rembert G. Weakland spoke to 10,000 attendees at the National Catholic Education Association on April 17. Archbishop Weakland stated, "Education is the key to economic success. And educators need to teach people to work to prevent the disparity between rich and poor in this country and globally from worsening in the rapidly moving economy." What focus on character development – ethical, moral, and spiritual – can be integrated with strategic content areas in a large church-related education system via CD e-paradigms to impact QOL?

What could I or should We do Monday? Competencies and skills for educators using technology for career development (CD) programs and services for awareness, exploration, and specialization with concentration phases must progress from browsing and mining to technological proficiencies. What can you do Monday? First, each care giver and educator (administrator, board member, counselor, parent, teacher, etc.) should select at least one technology and raise their awareness about current applications to life and work. Second, join a team to raise awareness on assistive technology applications of that technology to help ADA children and youth improve learning. What can you do Tuesday? Each care giver and educator could select an area of the economy and society and raise understanding of applications. Second, join a team to discuss competencies. What can you do Wednesday? Each educator and service provider will....

...create community learning centers and encourage children and youth to envision e-paradigms. What must we do by Thursday or Friday? Each unit in the education enterprise must develop a mindset and process to implement STRATEGIC THINKING based on VISION QUEST.

Attached is "A Personal Vision Quest Scenario and Action Plan Model" to assist each reader to chart a scope of work followed by a conceptual framework to focus on CD paradigm stages for emerging roles in business and engineering. Another sheet has a focus on application of Vision Quest in education in schools followed by a format for displaying action plan goals and objectives. The U.S. must develop strategy to move "...at a speed a tad quicker that marching in place."

A PERSONAL VISION QUEST SCENARIO AND ACTION PLAN

	2001-2002	2002-2003	2003-2004	2004-2005

Extrapolation of Technology
Biometric
  Eye Iris Recognition and Verification
  Facial Body Parts Recognition
Card
Voice
Wireless

Convergence and Integration
Agriculture
Manufacturing
Financial Services
Health Care Services
Education, PK through Post-doctoral

Areas: Alliances Globally
Asia
  China
  Hong Kong
  Japan
  India
  Korea
  Singapore
  Taiwan
European Union
  Ennis
  Denmark
  Finland
  Norway
  Sweden
NAPTA
  Canada
  Mexico
  U.S.
    Above Digital Divide
    Below Digital Divide

BOTTOM LINE

CAREER DEVELOPMENT E-PARADIGMS FOR TECHNOLOGY WORKFORCES FOR IMPROVED QUALITY OF LIFE GLOBALLY

Figure 8 is a framework - awareness and exploration through specializations with concentrations.

Career Development: Specialization and Business Concentrations
Chief Information Officer (CIO) and Knowledge Manager (KM) in Education/Training

	Accessing Information	Analyzing Information	Redistributing Information	Critiquing/Using Knowledge
Career Counseling Services		Curriculum Development Programs		

Early Specialization	Advanced Specialization	Concentrations
Business	CIOs and KMs in Businesses	KM in a Business
Market Analysis (MA)	MA in Asia Pacific, Trend Analysis	MA in North Korea
Manufacturing Chains		
Distribution – Logistics	Air, Land, and Sea (ALS) to Asia	ALS to Inchon
Retail, Resellor		
Services	Financial, Government, Health Care	Health Informatics (HI)
Wholesale		
Customer Relations Mg		eCRM in Health Care
Engineering	CIO and KM – apps of technologies for B2B, B2C, M-commerce	
Biomedical		
Civil		
Computer		
Electronic		
Environmental		
Industrial		
Materials Science		
Mechanical		
Other categories		

Advanced Exploration

Graphic Arts and Printing (GAP): Pre-Press, Press, and Post-Press

Early Exploration

Biometrics	Electronic Books Reach Libraries
Card	http://www.netlibrary.com
Graphic Arts	http://www.questia.com
Voice	http://www.ebrary.com
Wireless	http://www.jsonline.com/news
Electronic Publishing	http://www.electronic-publishing.com

Awareness

Figure 8. Career Development e-Paradigm for Digital Dividends, Awareness to Specialization

Application of Vision Quest in Education can be done in a variety of ways. An education reform strategy was launched in 1989 by governors and President George H. W. Bush based on goals. Readiness; graduation rate; core subjects; staff development; math, science, and technology; adult literacy; safe environment; and parental involvement became eight goal categories by mid 1990s. Many states used the eight goal categories for planning and could be used if required by policy. Far too much time was spent in formatting to the exclusion of (a) envisioning the extrapolation of technologies into the future, (b) interpreting the impact on life and work, and (c) converting the knowledge into a multi-year action plan and linking budgeting and planning in a meaning way. For example, readiness could apply to other goal categories, especially science and technology. Figure 8 is a display of goal categories, a vision, and a multi-year vision quest action plan.

Goal Categories for	Alternative Scenarios	VISION QUEST				
Synthesis of Research	Vision Co-creation	Year 1	Year 2	Year 3	Year 4	Year 5
1. Readiness	Centerfold of a "No Child Left Behind" Education Blueprint					
2. Graduation	Quality, Rate, Synchronization – Competencies and Skills					
3. Core Subjects	Discipline Subject Centered vs Problem Based Format					
4. Staff Development	Readiness – Novice vs Proficient Technologically					
5. Math, Science & Tech	Applications to Problem Solving – Outcomes and Solutions					
6. Adult Literacy	Native Language Proficient vs English as a Second Language					
7. Safe Environment	Emotional and Physical Safety as well as Fraud and Pornography					
8. Parental Involvement	Multi-generational and Neighbors plus Agency Personnel					

Figure 8. A Model to Display Goal Categories, A Vision, and a Vision Quest Action Plan

The National Assessment of Educational Progress (NAEP) has conducted assessments periodically since 1969 in reading, mathematics, science, writing, U.S. history, civics, geography, and the arts. "The Nation's Report Card" reports student achievement at grades 4, 8, and 12 for both nonpublic and public schools for the national and specific regions. http://www.nces.ed Although useful, above-mentioned goal categories and NAEP data do not provide insights about career development in children and youth or the relationship between career development and curriculum development to employment needs in a specific region or the nation as a whole.

Analysis of data and information about existing formats and structures is necessary but insufficent. Data focused on outcomes and processes related to what does exist in terms of format does not yield alternative scenarios from which to co-create a preferred scenario and a vision quest plan. Better formats for analysis of "external" data and information with audit of internal variables must be co-created to help shareholders to envision alternative scenarios such as partial technological and intensive use of technology. Vision Quest provides an opportunity to add breadth and depth of understanding about the drivers of globalization during an envisioning and alternative scenarios co-creation phase as a prelude to audit and action plan development. A model approach is

Preferred Scenario	IDEAL
What Exists Now	- REAL
Action Plan	NEEDS

A framework for arraying goals from vision quest at the college and university level is attached.

A CONCEPTUAL FRAMEWORK FOR A VISION QUEST SCENARIO AND ACTION PLAN

	2001-2002	2002-2003	2003-2004	2004-2005

A. Mission & Vision Attainment
1. University
2. School
3. Programs
4. Services

B. Functional Relationships
1. Communities
2. Corporations
3. Chambers of Commerce
4. Educational
5. Health Care Establishments
6. Human and Social Services

C. Qualitative Improvements
1. Curriculum
   a. Content Formats and Standards
   b. Delivery Format Systems
   c. Assessment/Evaluation Formats
2. Enrollment Management
   a. Recruitment
   b. Retention
3. Advising and Counseling

D. Human Resources Development
1. Learning Centered Culture
   a. Career Goals & Objectives
   b. Learning Style Preferences
   c. Research & Scholarship
2. Development Phases

E. Fiscal Resource Development
1. Capital Funding
2. Operating Resources
3. Alumni
   a. Annual Fund
   b. Major Solicitation
4. Applications
   a. Private
   b. Public

BOTTOM LINE

IMPROVED QUALITY OF LIFE (QOL) FOR MORE PEOPLE

Assessment and Evaluation Principles of Learning in ENCs

Assessment is defined as the systematic analysis of comparable data over equal increments of time to determine direction and impact of a strategy. Evaluation is defined as critique of assessment plan processes to increase the likelihood that increments of growth are in a strategic direction such as the design and implementation of a better approach to human resources development. "Strategies" refers to larger longer term schema and "tactics" refers to shorter term activities.

Professional education programs must not only be aware of state curriculum standards that their students must use in practice teaching, they must comply with regional accreditation standards. Clarity in program outcomes becomes a bit more complicated when configurations of courses, minors and majors, are required for certificates and degrees because multiple departments within a college or between schools within a university must achieve consensus.

Although a few curriculum standards by states mention IT in a generic way, no states have standards for emerging or evolving occupations listed earlier in this statement. Furthermore, although individuals in schools are preforming CIO-KM functions, no certificate programs could be found to prepare them in colleges or schools of education. One CIO certificate was found in an MBA program for individuals going into business. The May 2000 issue of Strategic Planning contains a list of states with curriculum standards that relate to IT (Groff, W., 2001).

Assessment of student progress toward meeting standards is critical. Program outcomes are essential that contain competencies and skills in preparation for (a) citizenship, (b) learning, and (c) work. Although most of this statement is about Career Development, all above-mentioned categories of outcomes should be specified for each career specialization and/or concentration. Assessment strategy can focus on competencies and skills of an individuals or a collaborating group of individuals. Collaboration in groups is mandatory in most of the emerging careers. Assessment tactics for career development for children and youth should be based on pedagogical policy and research and for adults should be based on andragogical policy and research.

Curriculum standards by states have tended to promote or require assessment strategies focused on an individual at various grade levels in exclusion to collaborative group problem solving. Assessment of critical thinking competencies and problem solving skills in online learning is in its early stages of development and not yet become a part of career pathway evaluation in ENCs.

Globalization and internationalizing curriculum is viewed as a high priority by many leaders. The extent to which globalization type resources are being integrated into curricula at elementary and secondary levels in unknown. The extent to which these resources are being integrated into preparatory programs or into induction and/or professional development programs is unknown. How CD providers are being trained to use technology for international careers is unknown.

Evaluation strategies should include broad based formative committee membership of regional shareholders and summative committee member with national and international shareholders. Evaluation will begin a new phase in critiquing electronically offered certificate and degree programs by regional accreditation standards (Statement, 2001).

Conclusions and Recommendations

Choosing a career and a set of career development learning experiences to prepare for life and work is one of the most difficult decisions a person makes. Application of technology to all aspects of life and work is not only causing a change from paper-based formats to electronic formats, the change is forcing providers of career development programs and services to analyze the needs and wants of clientele and the way technology can be used to improve decision making.

Culturally diverse learners vary greatly in terms of needs and wants. Providers of programs and services, including community-based, corporate-based, and education-based career development units, vary a great deal in quality and quantity in how they can meet needs. Competing priorities for limited fiscal and human resources force service providers into alternatives to meet demands.

Children are maturing into youth and faced with many emotional, physical, and social changes. Middle school staff are often not prepared well to deal with the problems in various contexts. Middle schools often get "hand me downs" for equipment and plants left over from expansions.

Career development services vary considerably from context to context even in the best systems. Awareness about emerging roles by administrators, counselors, parents, and teachers who are collaborating is necessary, but altogether insufficient to meet diverse children and youth needs.

Conceptual frameworks of school-based career development models must be modernized and upgraded based on advances in Computing and Information Technology. Career Pathways must be created with contemporary content in 4+4+4 campus/site-based formats and must also be made available in Anytime Anywhere Learning formats. School-based developmentally appropriate units could be used by the Boy Scouts of America in a logical sequence of requirements for 1st Class, Star, Life, and Eagle recognitions that could complement charter school or home based programs.

Few issues will be more important than co-creating articulated career paths in online formats for emerging occupations. Electronically Networked Cultures (ENC) can be created and sustained through a common mission and a shared vision with action plan. ENCs consisting of practitioners in an emerging family of occupations, like EC in its many variations, with faculty and teachers could (a) analyze competencies and skills to perform emerging roles and (b) convert information into content in articulated career pathway conceptual frameworks.

CIO-KM certificates must be created by professional education schools, especially institutions with library and information science and/or technology education programs. Imagine CIO-KM educators collaborating with Boeing CIOs and to convert non-classified technology used in the aerospace enterprise projects into developmentally appropriate learning units to excite children and youth to consider computer science or electronic engineering careers and delivered in AAL. Training Knowledge Managers (TKMs) have evolved in the private sector. TKM certificates hold potential for remaining current in the field of KM and contribute significantly to e-paradigms.

Digital dividends can be achieved for many nations and people through global strategic alliances. Preparing educators to use technology for CD in e-paradigms as well as in traditional settings is essential for equality of access to high quality opportunities both domestically and globally.

Action and Research Agendum

CONNECTIONS AND CONSEQUENCES

"The connections between scholars and policy and decision-makers are weak to nonexistent. So as a result, decisions too often are based more on intuition, on short-term gain, or on perceived market advantage, and less and less and less on thoughtful analysis of policy alternatives and carefully calculated estimates of implications and consequences."

Stanley Ikenberry, President of the American Council on Education, at "From Theory to Practice: An Anniversary Symposium" for the Center for the Study of Higher Education (30th year) and the Higher Education (50th year) at The Pennsylvania State University, June 2000.

American Council on Education http://www.acenet.edu

* *

Applied and basic research are both essential for Career Development and use of Vision Quest. Basic research, often a comparison between "control" and "experimental" conditions and groups, provides useful information for decision making. At the same time, however, a comparison cannot be made between phemonena that does exist with something that needs to be developed.

Applied research can be development problem solving methodology, like project management in business or engineering enterprises. Basic research is analyzed first by a formative committee via critical incidents and informed judgement techniques and critiqued by a summative committee. Career development programs and services are an example of how development problem solving methodology can be paired with evaluation problem solving methodology to create a good model.

Applied and basic research questions to co-create a career development model could include:
What advances in biometric research are important to include in curriculum standards?
What applications in biometric technology are essential in core curriculum standards?
What articulated career paths must be co-created in online and traditional formats?
What strategy can be used to raise consumer awareness about biometric technology?
What strategy can be used to browse and mine high quality information for learners?

A "What could We do Monday?" action and research agendum for CD e-paradigms is needed.

* *

ATTAINMENT

Statements of Purpose are necessary,
But something must eventually be done
to prove that attainment is possible.

Burl N. Osburn, "The Editor Has The Last Word,"
The Industrial Arts Teacher, Nov-Dec, 1961, p. 26.

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CAREER DEVELOPMENT

FOR

DIGITAL DIVIDENDS

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PREPARING FOR THE NEW WORLD GEOGRAPHY BEE

"Geography Bees" were common in schools along with bees in other disciplines. Geography Bees began with local, regional, and world physical geography ranging from low order cognitive factual information recall to higher order cognitive integration and synthesis. Bee questions extended to cultural, economic, and social dimensions using similar cognitive low to high processes. Today's competitive application of technology among developed nations requires a more competitive bee based on awareness about "Career Development e-Paradigms for Digital Dividends."

Citizenship, learning, and work have been the purposes of education in the U.S. for decades and phases of Career Development have been classified as awareness, exploration, and specialization. Awareness should include an introduction to technologies that are impacting all aspects of life. Biometric, card, voice, and wireless technology Web sites to browse and then mine are on page 3. Exploration should provide an opportunity to children and youth for analyzing emerging roles. Corporate Web sites are provided with vision statements, products/services, job descriptions, etc. Specialization focuses on KNOWLEDGE about global ECONOMIES that must be considered in preparing individuals in emerging roles by EDUCATION and be synchronized to regional needs.

A sample of questions to prepare for the digital dividends geography bee are on attached pages. Many of the answers are contained in "Career Development e-Paradigms for Digital Dividends." Some of the answers can be found by browsing original source Web sites mentioned in the paper.

Critical thinking competencies and problem solving skills are essential in analyzing information available only in electronic formats in databases in other countries in variable network standards. A few of the answers in the Specialization level will require that you access Blackboard.com and browse archived newsletters or bulletin board pages by following the directions below.

Access http://www.blackboard.com/courses/webcom/ and enter as a guest. Click on "Announcements" and then on "Course Documents." and click on "Warren Groff's Newsletters." Bulletin board Web pages can be accessed by clicking on "External Links" and "The Friendly Forum" and browse "The Friendly Forum: Class Discussion." Browse Asia Society, Globalization and the Family of IT Careers, Taiwan, Korea, etc.

The end of all our exploring will be to return to the place
from which we started and know it for the first time.
T. S. Eliot

CAREER DEVELOPMENT FOR DIGITAL DIVIDENDS

SAMPLE QUESTIONS

Awareness Level Question Samples

1. Name three of five countries leading in cell phone use by children and youth worldwide.

_____ _____ _____ _____ _____

2. Name the country with an island with no fixed telephone lines. _____

3. What does WAP stand for? _____ _____ _____

4. Name one of Europe's new "wired towns" with high level computer literacy due to their distribution in the 80s percent range. _____

5. Attention is focused on an evolving "proactive" relationship between children in what age range, teachers, and technology? _____

6. List 3 of 4 technologies being applied to all aspects of life and work that hold career development opportunities. _____ _____ _____ _____

7. Identify one of the above-listed technologies and describe a few applications.

8. List at least two categories of conditions in the Americans with Disabilities Act (ADA).

_____ _____ _____ _____ _____

9. List one ADA category and explain how Assistive Technology (AT) could enhance career development opportunities. _____. How can AT help ADA people in _____?

Exploration Level Question Samples

1. List things Ananova and do now and the list things she will be able to do in the future.
Things Ananova can do now _____ _____
Things Ananovs will be able to do in the future _____ _____

2. List the three modes of transportation included in distribution logistics that must be coordinated in international commerce.

_____ _____ _____

3. What city is a major agricultural export center for the midwest? _____

4. List two of five companies forming a medical marketplace. _____ _____

5. Chicagoland hopes to become a global leadership in what technology? _____

6. What region was designated as the best place to do business by The Industry Standard? _____. List three reasons why. _____ _____ _____

7. Boeing's CEO Phil Condit spoke on what topic for the Australian Information Strategic Alliances Summit. _____ _____ _____: _____ ___ _____.

8. List four of eight countries for which bulletin board pages were developed by K. Green for career planning information that could be used by enrollees or individuals from foreign countries.
_____ _____ _____ _____

9. List four of 12 categories of country information that is provided and for which Web site links are available to other sources. (Do not include Date/Time and Map)

_____ _____ _____ _____

Specialization Level Question Samples

1. A CyberStart program is enhanced by one of the USDE approved reform models, Lightspan. Describe program support services available worldwide from Lightspan. (Note. Contestants from participating countries will use their primary language and voice activated system to respond to the question and the voice recognition software will translate the response into English, the dominant language of commerce and diplomacy, and voice verification software will analyze key words against criteria established by the international panel of judges to arrive at the student winner.

2. Career opportunities are increasing for individuals with international competencies and skills. Identify one Web site that provides information about international opportunities and discuss it.

3. Inchon National University of Education conducted a session on what four basic technologies for faculty and graduate students majoring computer science in education in May, 1999?
_____ _____ _____ _____.

4. National Taiwan Normal University created a strategic plan for a program to produce teachers and technicians in a critical industry essential to effective communication. Name the program _____ and discuss the importance of the industry and program.

5. The International Telecommunication Union (ITU) implemented an initiative in e-commerce. Discuss the significance of the initiative for 5 of 6 billion people not connected to the Internet. This is Part A of a two part question. Part B should be answered after questions 6 and 7.

6. Boeing is a member of a strategic alliance. Discuss how an alliance for elementary education between 11 universities in South Korea and the U.S. could contribute to reunification. Then, also discuss how a strategic alliance on a specific technology, like voice technology, and a product, like EV2, could yield digital dividends and improved QOL for Asia Pacific countries and the U.S.

7. An Asia-Pacific Regional Operations Center (APROC) has a focus on Taiwan in the 21st-century with a sound and vigorous economy, stable society, and highly educated workforce. APROC concentrates on six centers (a) Manufacturing Center, (b) Sea Transportation Center, (c) Air Transportation Center, (d) Financial Center, (e) Telecommunications Center, and (f) Media Center. Discuss the significance of APROC to Taiwan, highlighting two of the six centers. Discuss the potential for a strategic alliance between Taiwan and the U.S., especially for career development in emerging roles.

Follow direction about how to access Blackboard.com and how to access "Taiwan." Analyze the Web sites for MOEA and MOE along with some of the other leads provided on that bulletin board. Link to several of the sites, including National Taipei University of Technology (NTUT).

5B. ITU created a Fellowship Programme for youth at ITU Telecom Africa in Johannesburg in November 2001. The Fellowship Programme funded one individual of college age from each member state in Africa. The Youth Forum provides opportunity for participants to analyze
(a) policy, regulation, and market structure in African countries and elsewhere;
(b) the fundamentals of building a dynamic communications environment;
(c) how business is related to the world of communications; and
(d) applications and business concepts entering and evolving in Africa.
Discuss the preparation you would make as a Youth Forum participant in ITU Telecom Americas 2002 or in ITU Telecom Asia 2002. Also, discuss follow through activities for CD e-paradigms.

8. Church affiliated private education is contributing significantly to improved Quality Of Life worldwide. Describe how character development (ethical, moral, or spiritual) can be integrated with content areas related to globalization, including CD for emerging career, and delivered online.

9. Complete your "Personal Vision Quest Scenario and Action Plan" and then discuss it in terms of the technology your will analyze, the sector of society for which you will critique applications of convergence and integration, and the area of the world for which you will become more aware. Second, convert that information into KNOWLEDGE about competencies and skills that will be needed by 2020 and relate them to Career Specialization with Concentration(s). Third, discuss the nature of the contribution yo can make to planning as it related to STRATEGIC THINKING. Third, describe a domestic CD community service project to help reduce the digital divide. Fourth, describe an intercultural international service project to help reduce the digital divide.